

BUNKER

'Appl. No. 10/065,108

August 22, 2003

REMARKS/ARGUMENTS

Reconsideration and withdrawal of the outstanding grounds of rejection is respectfully requested in light of the above amendments and the remarks that follow.

The Examiner has rejected claims 1, 2, 4-10 and 12-22 under 35 U.S.C. 103 as unpatentable over Ritter '816 in view of JP '901 and/or Glezer '397. According to the Examiner, it would have been obvious to employ the surface concavities taught by Glezer or JP '901 on either or both of the inner and outer walls of the cooling channels in Ritter in order to enhance the cooling of these passages.

Ritter '816 discloses a combustor/transition piece for gas turbines in the form of a double walled cylindrical component having axially extending, discrete cooling slots or passages 44. In the first instance, it is not clear from Ritter '816 where the member 40 is located within the overall scheme as illustrated in Figure 1. There is a reference in column 4 to the construction of "combustors or combustor sections and transition pieces." There is also a reference to hot combustion gases flowing through the inner portion of the combustor 18 and the member 40, 42, but there is no indication whether the member 40, 42 is placed upstream or downstream of the transition piece 38; nor is there any teaching that it connects the combustor liner to the transition piece.

The secondary reference to Japan '901 is not at all relevant to the subject invention. This reference describes a method of forming a rough wall surface in the form of very small hemispherical bumps, which when inverted into the resulting cast structure, provide a surface roughness of negative imprint. The sizes of the bumps are set by

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powder particles having a size in the range of about 180 microns to about 600 microns.

Moreover, the patent is not at all concerned with the enhancement of cooling flow by the formation of eddies within individual concavities.

The alternative secondary reference to Glezer discloses the formation of concavities 84 along the outside or exterior surface of a combustor 80, with the concavities facing a radial passage 86 between the liner 80 and the combustor cooling shield 72.

The combination of references as cited by the Examiner fails to evidence the obviousness of the subject matter of independent claims 1 and 12 as amended herewith. Specifically, claim 1 has been amended to require a ratio of cooling channel height to concavity diameter to be in the range of 0.25 to 5. In Ritter, the ratio of channel height (0.03) to the concavity diameter described in Glezer (0.22 inch) is .13, outside the range now required by independent claim 1. Moreover, there is no suggestion in the reference that such a ratio has any significance.

Nor is there any suggestion in Glezer that the concavities described therein would be useful in the context of a series of discrete axial passages in a double walled connector segment as described in Ritter.

For the above reasons, it is respectfully submitted that independent claim 1 is patentable over the applied prior art, i.e., the references as combined would not have suggested the subject matter of claim 1, absent hindsight gained from applicant's own disclosure.

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With respect to independent claim 12, the same limitation as described above in connection with claim 1 has been added to claim 12 and, in addition, claim 12 now also requires that the cooling channels have an aspect ratio of from 0.2 to 1. In Ritter '816, the cooling channels have an aspect ratio of .1, also outside the range now required by independent claim 12. Claim 12 also requires concavities in both radially inner and outer walls of the passage. It does not appear that this limitation is suggested by the prior art.

Accordingly, claim 12 also defines over the combination of references as applied by the Examiner.

It follows that remaining dependent claims 2, 4-9 and 13-17 and 22 are also patentable over the prior art.

The Examiner has also rejected all of the application claims as unpatentable over Ritter '853 in view of Japan '901 and/or Glezer '397. This combination of references fails to meet the requirements of independent claims 1 and 12 for essentially the same reasons as presented hereinabove. In other words, this new combination fails to disclose or suggest a ratio of channel height concavity diameter in the range of 0.25 to 5 (claims 1 and 12) or the required aspect ratio of 0.2 - 1.0 (claim 12). Accordingly, the remaining claims are also patentable over the above combination of references.

New dependent claims 23 and 24 further define the ratio specified in the respective independent claims as being between the more preferred range of .5 to 1. These claims are also patentable over the art cited by the Examiner.

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It is respectfully submitted that all of the remaining claims 1-9, 11, 12-17 and 22-24 in this application are in condition for immediate allowance, and early passage to issue is requested. In the event, however, any small matters remain outstanding, the Examiner is encouraged to telephone the undersigned so that the prosecution of this application can now be completed.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By:


Michael J. Keenan
Reg. No. 32,106

MJK:ljb

1100 North Glebe Road, 8th Floor
Arlington, VA 22201-4714
Telephone: (703) 816-4000
Facsimile: (703) 816-4100